

# Jessica R. Murray

United States Geological Survey  
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## EDUCATION

<b>Ph.D.</b>	Geophysics, <i>Stanford University</i>	<b>1/04</b>
<b>M.S.</b>	Geophysics, <i>Stanford University</i>	<b>6/00</b>
<b>Teaching Certification</b>	Earth Sciences, high school level (MA and NH), <i>Dartmouth College</i>	<b>12/96</b>
<b>A.B. with high honors</b>	Earth Sciences, <i>Dartmouth College</i>	<b>6/96</b>

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## RESEARCH INTERESTS

My research focuses on understanding interseismic deformation and how it modulates the earthquake cycle. An area of ongoing work is the identification and quantification of aseismic strain release. The goal is to use such observations to better understand the stressing history on a fault, the interplay between aseismic and seismic slip, and the conditions under which stable slip occurs. Specific projects which I have undertaken are 1) imaging the interseismic slip-rate distribution on the San Andreas Fault near Parkfield, CA using GPS and trilateration data, 2) testing the time-predictable earthquake recurrence model by using geodetic data to infer bounds on the expected recurrence time for the anticipated M6 earthquake on the San Andreas fault at Parkfield, CA, and 3) time-dependent inversion of GPS and EDM data to simultaneously image temporal and spatial variations in fault slip. Technical aspects of these projects include optimization of GPS processing strategies, exploration of methods for mixed- and underdetermined inversion, application of constrained inversion techniques, use of the bootstrap for estimation of confidence intervals, and adaptation of the Kalman filter for use in temporal inversion of a variety of deformation data types with complex error spectra.

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## HONORS AND AWARDS

<b>Mendenhall Postdoctoral Fellowship</b>	U. S. Geological Survey	<b>12/03-present</b>
<b>Outstanding Student Paper Award</b>	American Geophysical Union, Geodesy section, Fall Meeting 2002	<b>1/03</b>
<b>Stanford Graduate Fellowship</b>	Chevron Fellow	<b>9/98-9/01</b>
<b>Magna Cum Laude</b>	Dartmouth College	<b>6/96</b>
<b>Upham Award</b>	(co-recipient) for original geological research	<b>6/96</b>
<b>John Ebers Prize</b>	for most deserving earth sciences student	<b>6/96</b>
<b>Presidential Scholar</b>	designates completion of an integrated research program and graduation with honors	<b>6/96</b>
<b>Tucker Foundation Citation</b>	for commitment to community service	<b>6/96</b>
<b>Estwing Award</b>	for outstanding junior earth sciences major	<b>6/95</b>
<b>Francis L. Town Scientific Prize</b>	for top sophomore in earth sciences	<b>6/94</b>

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## AFFILIATIONS

<b>Honor Societies</b>	Phi Beta Kappa Golden Key National Honor Society Sigma Xi Scientific Society
<b>Professional Societies</b>	American Geophysical Union Seismological Society of America

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## ACADEMIC SERVICE

<b>Webmaster, Tectonophysics section, American Geophysical Union</b>	<b>11/02 – present</b>
<b>Academic Advisor, Stanford University</b> Advisor for seven first-year undergraduate students.	<b>9/01 – 6/03</b>
<b>Student Representative, Stanford University</b> Elected as Geophysics representative to Graduate Student Advisory Committee.	<b>4/01 - 4/02</b>
<b>Student Mentor, Stanford University</b> Mentor to first-year graduate students in Geophysics.	<b>9/99 - 6/02</b>
<b>WISP Mentor, Dartmouth College</b> Mentor for a first-year student through the Women in Science Project.	<b>9/95-6/96</b>

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## TEACHING EXPERIENCE

<b>Teaching Assistant, Stanford University</b> Earthquakes and Volcanoes, taught by Gregory Beroza and Paul Segall; duties included leading review sessions, holding office hours, grading homework.	<b>9/01 - 12/01</b>
<b>Teaching Assistant, Stanford University</b> Global Positioning System in the Earth Sciences, taught by Paul Segall; responsible for grading homework, GIPSY software instruction.	<b>1/01 - 3/01</b>
<b>Teacher, Swiss Semester</b> Taught geology at an abroad program for high school students, planned lessons, developed lab activities to be carried out during field trips.	<b>8/97 - 12/97</b>
<b>Teacher, Bristol Community College Upward Bound Program</b> Planned curriculum and lab exercises for geology, physics, and chemistry classes.	<b>6/97 - 8/97</b>
<b>Student Teacher, Mascoma Valley Regional High School</b> Responsible for planning and teaching three chemistry classes.	<b>9/96 - 11/96</b>
<b>Teaching Assistant, Dartmouth College</b> Led lab exercises and field trips for introductory physical geology course.	<b>3/96 - 6/96</b>

**Grader, Dartmouth College**

**3/96 - 6/96**

Graded exams for environmental geology course.

**Tutor and Study group leader, Dartmouth College**

**9/95 - 6/96**

Tutored individuals and led a study group for introductory physical geology course.

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### **PRACTICAL EXPERIENCE**

**Extensive Matlab and C-shell scripting:** Developed Matlab code for inversion, optimization, and Kalman filtering; wrote shell scripts for automated GPS data processing with GIPSY software.

**GPS surveying:** Operated geodetic-grade GPS equipment and processed GPS data with the goal of millimeter-level accuracy.

**Mineral Cathodoluminescence:** Used luminoscope and associated software for imaging cathodoluminescence in mineral samples and identifying its sources.

**Thin section preparation:** Produced thin sections from friable rock samples both by hand and using Logitech equipment.

**Other experience:** Assisted with geologic mapping in the Eastern Sierra using EDM instrumentation; Compiled index for and assisted with editing of a textbook on dinosaur paleontology; Carried out initial preparation of tree ring samples for stable isotopic analysis.

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